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Diploma in Pharmacy 2nd Year
Hospital & Clinical Pharmacy
Experiment

To demonstrate / simulated/hands-on experience on the identification, types, use/application /administration of different types of bandages such as sterile gauze, cotton and crepe bandages.

Aim:

To demonstrate / simulated/hands-on experience on the identification, types, use/application /administration of different types of bandages such as sterile gauze, cotton and crepe bandages.

Reference :

‘ Dr. Gupta G.D. , Dr. Sharma Shailesh, Dr. Sharma Anshu, “Practical Manual of Hospital & Clinical Pharmacy” Published by Nirali Prakashan, Page no 29 - 34

Theory :

1. **Bandages :** The process of covering a wound or an injured part with a fine cloth is termed bandaging. Bandages are cloth strips, gauze (e.g., roller gauze), or elasticised materials (eg, ace bandages) used for binding a body part. They are 1-6 inches wide and are available in packed rolls. Bandages should be tightly applied to keep dressings and splints intact; however, it should not be tight enough to cause injury to the part or to block blood circulation.

   General Principles of Bandaging: The general principles of bandaging are as follows:

   i) The patient should be placed in a comfortable position that is also convenient for nursing assistance.

ii) If required, the part to be bandaged should be well-supported and raised.

iii) The nurse should stand in a position directly facing the patient or the part to be bandaged.

iv) A bandage should achieve its purpose to keep the dressing intact, to support the injured part, or to immobilise it.

v) A bandage that is small in diameter can be kept intact, by applying and fixing it atleast two circular turns around the injured part.

vi) Skin surfaces should be separated using a gauze or cotton. While applying plaster casts over the bony areas, special padding should be used.

vii) The bandage should always be applied to the right.

viii) The bandage should be applied parallel to the direction of venous circulation to apply uniform pressure.

ix) Fingers and toes should be covered with bandages only if it is required to cover the wound; otherwise, fingers and toes should be left uncovered to observe the circulatory changes.

x) Applying wet bandages should be avoided as they tend to shrink and become tight on drying.

xi) Bandages should not be applied too loose, or else they will slip and expose the injury. xi) The turns of bandages should always be in clockwise direction, except if

xii) required to turn anticlockwise due to special reasons. The bandage roll should be held in the palm in such way that the free end of the bandage i

xiii) undulating out of the roll. xin) After applying the bandage, the ends should be secured by pinning with safety pins or strapping adhesives.

General Rules for Applying Bandage: The following rules should be taken into consideration while applying bandages:

i) The injured body part should be bandaged in its normal position and supported with the joint somewhat stretched to avoid strain on the ligaments and joint muscles.

ii) To avoid friction, pads should be placed between the skin surfaces and over the bony parts.

iii) Bandage should always be applied on the body parts starting from the distal end to the proximal end to maintain the backflow of venous blood.

iv) To avoid blocking blood circulation, bandage should be applied with constant pressure.

v) The body part to be bandaged should be cleaned and dried first. Unnecessarily thick or extensive bandage should not be applied to prevent damaging the epithelial cells by prolonged heat and moisture on the skin.

vi) To check the adequacy of blood circulation to the body extremities, the ends of fingers or toes should not be bandaged.

vii) Dressings should be covered with bandages 2 inches beyond the edges to avoid contamination of the dressings and wounds.

viii) While applying a bandage the first aider should stand facing the patient and start from the injured side to maintain constant pressure and proper direction of the bandage.

ix) Pins and knots should be placed away from the injured part, a pressure point, or a tender and swollen area to avoid discomfort and unwanted pressure.

x) A reef knot should be used to fix the bandage ends to comfort the patient, to avoid sliding of the knot, and to ease its removal.

Types of Bandages: The types of bandages are discussed below:

i) **Inelastic Bandages :** These are further divided into:

a) **Domette Bandage :** Two types of yarn (ie., union fabric) are used for making this bandage. Cotton is used for wrap and the weft is made of wool. Higher wool content (not less than 66.6%) imparts warmth and support, thus is used for orthopaedic purposes.

b) **Triangular Calico Bandage :** This bandage is an unbleached calico piece of right-angled isosceles triangle shape. It has warp and weft threads parallel to the two equal sides. The base length is about 54 inches. It is used for head dressings, binders, arm slings, and temporary splints for broken bone.

c) **Cambric or Open-Wove Bandage :** This bandage has a plain weave with the weft containing more threads per cm compared to the warp. It is used for domestic purpose and first-aid. It secures and protects dressings, supports splints to the body and immobilise it.

ii) **Elastic Bandages :** These are further divided into:

a) **Crepe Bandage :** This is a well-known elastic bandage with zero rubber content. Crepe bandage is an elastic fabric of plain weave having cotton and wool warp threads and cotton weft threads.

Figure 3 depicts the arrangement of threads in crepe bandage:

- 1x two-fold cotton thread with 'S' twist,
- 2 wool threads,
- 1 x two-fold cotton thread with 'Z' twist, and
- 2 wool threads.

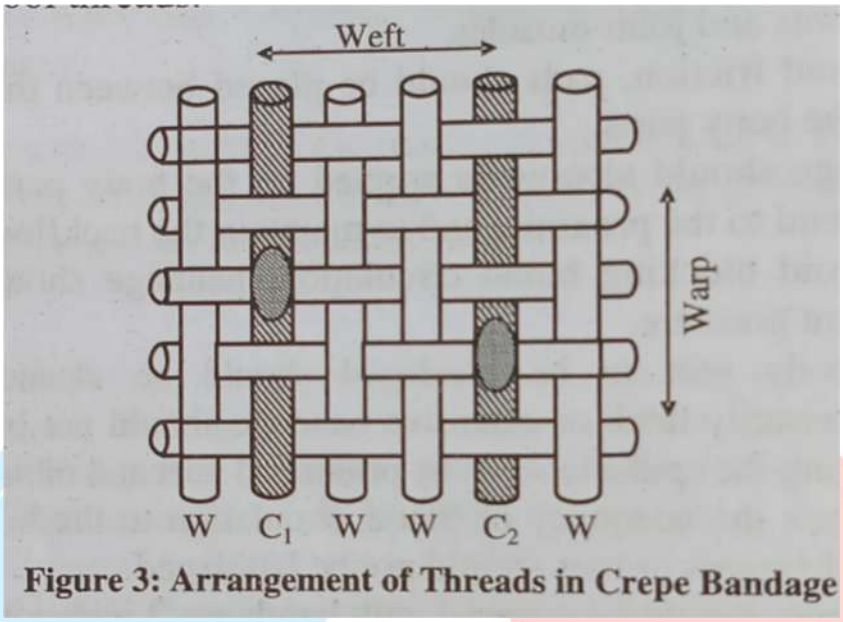


Figure 3: Arrangement of Threads in Crepe Bandage

b) **Cotton Crepe Bandage :** This is another form of crepe bandage, which provides light support to sprains and strains, and serves some correctional purposes. The warp threads arrangement in this bandage is likewise:

1. 2x two-fold threads with 'S' twist, and
2. 2x two-fold threads with 'Z' twist, repeated to the edge.

c) **Cotton and Rubber Elastic Bandage or Cotton Elastic Bandage :** This bandage resembles crepe bandage but contains rubber threads in the warp. Its arrangement is as follows: a) Combined cotton and rubber thread, having two spirally folded threads, and each thread has 1 rubber and 2 cotton threads.

d) **Cotton Conforming Bandage :** This acts as a conforming bandage. The cotton gauze is mercerised at controlled conditions to make the fibers 'crimped' (bent), thereby both warp and weft acquire elasticity. It has the property to take shape as per the body contours, so reversing or twisting is not required. The crimped fibers interlock in such a way that the overlapping parts do not slip.

iii) **Impregnated Bandages:** These are further divided into:

a) **Plaster of Paris Bandage :** This bandage is made up of cotton cloth of leno weave, and impregnated with dried calcium sulphate and adhesives (e.g., methylcellulose and bypromellose) It supports and immobilises the broken bones and joints

b) **Zinc Paste Bandage :** This is an open-wove bandage, impregnated with zinc oxide paste; e.g., zinc paste and coal tar bandage contain coal tar along with paste of zinc oxide, and zinc paste and ichthammol bandage contains ichthammol in addition. This bandage is used for treating chronic skin disorders like eczema and leg ulcers.

2. **Gauze:** Gauze is an absorbent material having enough strength to serve as surgical dressings.

Types: It is of the following types:

i) **Absorbent Gauze:** It is a non-medicated, soft cloth of plain weave, open texture, and delicate appearance Gauze comes in variety of grades depending on its mesh or number of threads per square centimeter. It is placed over the wounds and covered with a dressing of better absorptive and protective capacity Wicks of gauze are used post-surgery for draining exudates from large wounds

ii) **Absorbent Ribbon Gauze:** It is also non-medicated, however, it has a closer and finer texture. It is made up of cotton, rayon, or both. It is used for packing dental sockets, sinuses, infected wounds, etc.

iii) **Gauze Pad or Absorbent Gauze Pad or Gauze Sponge or Gauze Swab:** It is an absorbent gauze available as folded square pad. The number of layers (ply) it is folded into and its dimensions depends on its use Wound dressings and packing can

be done by using pads of any size. Swabbing during surgery is done by using small pads.

iv) **X-Ray Detectable Gauze Pads:** The above three gauzes are also available in the form of X-ray detectable gauze pads. The gauze is attached to a differently coloured X-ray detectable strand having 55% barium sulphate or any other non-toxic material of comparable X-ray opacity. These gauze pads are non-toxic, soft, and non-abrasive. They persist permanently detectable since they do not deteriorate in the body. nor they get affected by sterilisation or time.

v) **Filmated Gauze:** It is a folded absorbent gauze. It is prepared by placing thin and uniform films of cotton or rayon over each other. It is very soft and presents quick absorption.

vi) **Medicated or Antiseptic Surgical Gauze:** Its use has been limited nowadays, because antibiotics and other therapeutic agents have developed. Iodoform gauzes contain 5% iodoform, and are used as a packing or drainage material.

3. **Cotton:** In the U.S.P surgical cotton is official as purified cotton. Cotton is the basic surgical absorbent mostly used. Non-absorbent cotton or absorbent cotton wool is made up of raw fiber which has undergone a series of treatments for removing the natural waxes, impurities, and foreign
materials. These treatments make the fibers absorbent in nature. A thick layer of cotton wool is although of less weight, but imparts effective physical protection, warmth, and a barrier against infection to the wounded area.

Non-absorbent bleached cotton is prepared by a modified bleaching process to retain the natural oils and waxes providing water repellent property. It is silky to feel. It is used for packing, padding, and

cushioning of dressings over wounded areas. Since it is non-absorbent, it provides support to sanitary napkins and drainage dressings

Pharmacopoeial Tests for Quality - Absorbent Cotton Wool (L.P.)
Absorbent cotton wool is made up of good quality trichomes or combers derived from the seed coat of various species of Gossypium Lin. genus. The trichomes are cleaned, purified, and bleached without using any colouring matter.

Description: Cotton fibers (of length 10mm or more) are white coloured, and contain traces of leaf residue, seed coat, and other impurities. On being pulled, they offer significant resistance. On gentle shaking, they do not shed much dust.

Identification

i) On treating the fibers with iodinated zinc chloride solution, they turn violet.
ii) On microscopic examination of the fibers, a single cell (4cm long and 40µm wide) in the form of a flattened tube having a thick and rounded matter is observed. Sometimes isolated foreign fiber is also observed.

Acidity/Alkalinity: 15gm of fibers are macerated for 2 hours in 150ml water. The water is decanted and the residual liquid is squeezed out with a glass rod. 0.1ml dilute phenolphthalein solution or 0.05ml of methyl orange solution is added to 25ml of each extract A pink colour should not develop to any solutions.

Surface Active Agents: In a 25ml graduated ground glass stoppered cylinder (rinsed with sulphuric acid and water), portions of the extract are added. The mixture is shaken 30 times in 10 seconds, left undisturbed for a minute, and then again shaken with the same

frequency After 5 minutes of the last shake, the height of froth does not exceed 2mm above the liquid surface.

Neps: It is uniformly spread as a thin layer (0-5gm for an area of 450cm) between two glass plates and observed with naked eyes under transmitted light. The sample does not show more than an average of about 250 neps for three tests.

Result :

Identification, types, use / application /administration of different types of bandages such as sterile gauze, cotton and crepe bandage was demonstrated.

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